

Protocol of exploitation of CLF by Entrepreneurs



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Introduction

The EXAM 4.0 platform aims at becoming the European reference platform for knowledge generation and exchange, innovation, collaboration and service provision for VET/HVET centres and companies working in Advanced Manufacturing. The Exam 4.0 platform is an unparalleled partner for manufacturing companies, institutions and teachers, students and alumni to excel in the digital age.

Following the piloting process of Advanced Manufacturing Labs for H/VET through the Collaborative Learning Factory (hereafter CLF), the EXAM4.0 partners have generated a number of reports documenting the work we have carried out. The structure of the piloting process is as follows, where each “ball” refers to a specific report:

Labs for Advanced Manufacturing-CLF

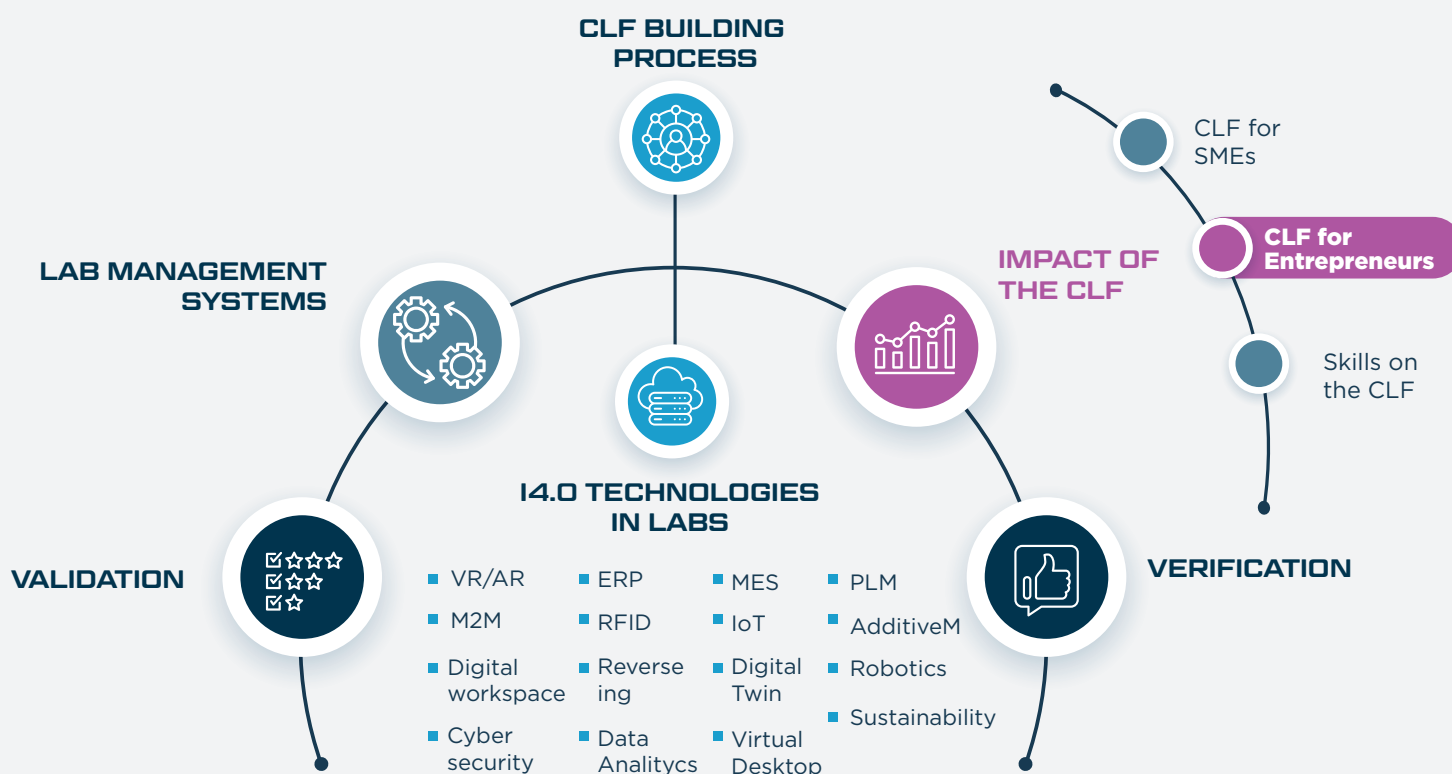


Figure 1: Piloting process of Advanced Manufacturing Labs. Source: EXAM4.0



This report, **Protocol of exploitation of CLF by Entrepreneur**, it is part of the impact side of the approach, specifically, impact of CLF for Entrepreneurs, as shown in figure 1

For entrepreneurs in the field of Advanced Manufacturing the network bundles industry knowledge and technology expertise with information on skills needs and training demands, as well as on new job profiles and the corresponding new qualification requirements. Together with institutions, expert groups around specific I4.0 technical trends, it forms a unique ecosystem to deliver insights in new trends, skills mismatches and life-long learning opportunities with Micro-credentials. With this platform entrepreneurs are supported in the first steps on launching their business.

This document describes how entrepreneurs in Advanced Manufacturing can benefit from the Collaborative Learning Factory. With the contribution of the partner companies and based on existing programmes of some project partners, entrepreneurs are facilitated in the essential first steps of building up their innovation process, product development and collaboration with (international) partners in the community.

How the CLF supports the entrepreneurs

The network of Collaborative Learning Factories (CLF's) can boost applied research for entrepreneurs. By providing a comprehensive advisory service in the process of starting up their company, the possibility of using a properly equipped office in the first period of operation and the possibility of using the factory facilities, such as the centre's workshops to carry out prototypes of the product under study. The exchange of experiences, the constitution of new projects as a result of business collaboration, the visualization of vocational training entrepreneurship, or the search for new clients will be some of the objectives pursued by this platform. To achieve those goals, it is important that VET Centres comply with their available facilities, equipment and, of course, the level of digital transformation. The CLF concept developed within EXAM 4.0 allows demonstrating the capabilities and applicability of different I4.0 key enablement technologies. CLF's also help to update the technology of teachers and trainers and to improve the skills of the staff.

As with companies, VET centres should be demonstrators for entrepreneurs. The fact that they can see and learn about the latest technologies in Industry 4.0 can make them come up with new business ideas related to the topic. This will feed the collaboration with other stakeholders within the community. As with companies, the resources that entrepreneurs have are in many cases rather limited. It is not easy for many entrepreneurs to have access to the latest trends and opportunities that I4.0 is bringing. Even being aware of those novelties, it is not easy to try those new technologies and concepts due to the large investment that this entails. Considering the CLF's and the support to entrepreneurs in those technical services, it is essential that the labs of the VET centres can serve as a demonstrator of the opportunities that 4.0 technologies can offer entrepreneurs. Testing new technologies and technological applications and teaching entrepreneurs within the CLF, provides the opportunity to develop new applications without large investment of time and money. Supported by expert teachers with knowledge of technologies or conditions to tackle digitization processes, CLF's facilitate the digital transformation process of new companies that entrepreneurs create.

Vocational Education & Training Centres play an important role in the promotion of entrepreneurship in general and have the necessary knowledge, skills and facilities to support and collaborate with entrepreneurs. By providing the entrepreneur with a comprehensive assessment service during the start-up process for their company, the possibility of using a duly-equipped office at the teaching centre for the company's first months of operation, and if the project requires doing so, the possibility of using other facilities, such as centre shops to make prototypes of the product being studied.

VET centres make available tools that allow the entrepreneur to launch the process of creating their own company, putting resources that can help build their company at the disposal of the businessperson (searches for premises, business incubators, contacts with support agencies) and helps to generate a business culture and mentality so that people can be entrepreneurs throughout their professional career (intra-entrepreneurs).



Figure 2 : Process of Collaboration within the community. Source: DVC

In collaboration with the CLF stakeholders, a community of experts with many years of experience provides actual value to the entrepreneurs. Within the community all necessary services for entrepreneurs are provided, such as promoting network, working on “visibility” for the collective of companies within the regional community, information, training and assessment, strengthening entrepreneurial projects (the company developing), starting up a marketplace, etc.

2.1. The role of the coach

A key role within the community is the role of the coach. For all involved stakeholders this is the first point of contact. Main tasks for the coach are:

- **Awareness campaigns:** Consist of making all potential entrepreneurs – present students, alumni and people who have attended courses at the centre – aware of the service. It also informs the general educational community and local entrepreneurial agencies that could collaborate with, strengthen, and raise awareness of the service, such as teaching staff, local and regional development agencies, or business incubators.
- **Welcoming the Entrepreneurs and a first contact where their contact details are taken.** Explanation of the services and facilities is given and a first step to share their ideas will be facilitated. This can be done for example by asking to complete a business model canvas and short SWOT analysis to begin working on the idea.
- **Referral to other entities:** local or regional development agencies or continued work with the entrepreneur. Once the idea has been formalised, there are two options: referral to an agency, which will help with market research, the viability plan, etc., or continuing to work directly with the entrepreneur on the same.
- **Tracking the project, a work timetable laying out the creation and launch** of the company is created, followed, and elaborated with relevant contacts (training, organisations, paperwork) to allow it to be followed.

An online platform facilitates the collaboration and exchange of information about all the processes in CLF and VET-centre. The platform consists of a database where information is gathered and shared regarding awareness-raising activities, projects carried out and information about the created companies and their history.

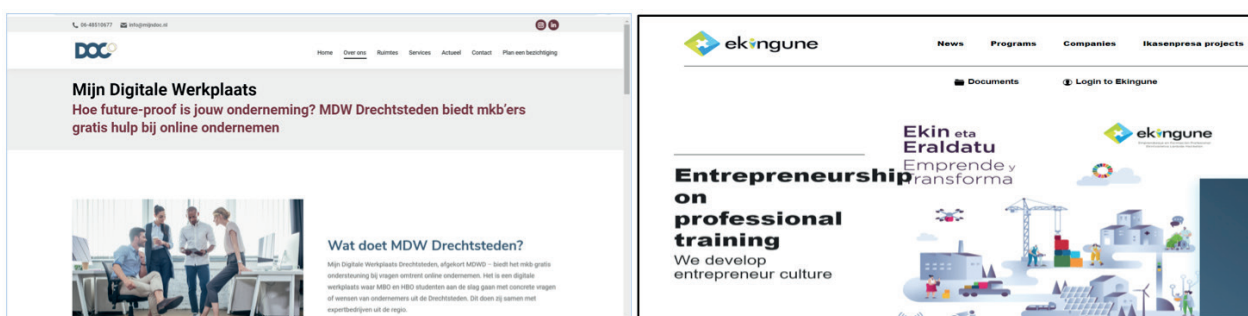


Figure 3 Examples of platforms to support entrepreneurs Source: DVC and Tknika

Collaboration within the community is carried out by means of peer groups. In meetings with the tutor/coach there is room for the exchange of experiences, materials, contacts and knowledge, and relevant information about how to carry out the coach's role. Attending the meetings is necessary for the programme to function and improve, which it can do through the contributions of professionals at these meetings. It might be helpful to have a dedicated coordinator who organises these meetings and attends the needs of the group, and ensures that the coaches adequately support the creation of companies.

The programme coordinators ensure that tools to enable the coaches to do their job are made available to offer high quality, professional and bespoke support to the entrepreneur. These may be technical tools that allow us to familiarise the entrepreneur with the job market, and communicative tools which can help us to know what our role is and how best to support the entrepreneur whilst at the same time promoting autonomy.



Figure 4 Peer learning with other entrepreneurs Source: DVC

Entrepreneur will develop the following Skills and abilities:

- Capacity for hard work
- Autonomy
- Ability to detect risks
- Ability to deal with setbacks and frustrations
- Turning project ideas into reality
- Innovation and creativity
- Identifying opportunities and resources
- Managing Technology
- Open-mindedness
- Ability to manage a business

One of the main objectives of the communities is to generate and reinforce from Vocational Training actions that strengthen the entrepreneurial ecosystem of VET, promoting innovation to create an economy and social value, and one of the most significant difficulties of the program is to promote science and technology-based entrepreneurship with the potential for exponential growth.

The facilitators have to work on confidence, communication, creativity, leadership, motivation, as well as the necessary business knowledge to be able to undertake. For this, it is crucial to involve the centre staff, making entrepreneurship the strategic axis of the training.

To promote emerging business models, innovation and entrepreneurship must go hand in hand, which is why it is necessary to coordinate the work of all the teaching staff at the centres, both technical and those who work in soft competencies and analysing the technological projects developed by the network and capturing those that may emerge in the market. In this respect, it is worth mentioning those companies that have been created over the years or that are the driving force behind future businesses. Once a business has been made in the centre, it is necessary to monitor it to favour its permanence in the market and continue supporting the entrepreneurs if they have a particular need or difficulty. The best way to do so is to maintain periodic and fluid contact with them, in the way we consider most, checking the effective progression of the Business Plans and continue supporting so that the business remains active, identifying its needs and communicating them to the CLF, to see whether the stakeholders within the community may be able to help, working on the 'visibility' of the companies linked, training and consultancy; strengthening of business projects (business development); setting up a Marketplace, etc.

In this chapter some examples are described how the CLF can be used by entrepreneurs to start-up their business.

4.1. Advanced Manufacturing (AM) in a Box

AM in a box is a not-yet created mobile education environment for Advanced Manufacturing. The purpose of AM in a box is that several parties, nationally as well as internationally within EU, should be able to use this for Advanced Manufacturing technological vocational training at different levels, to create broader knowledge regarding Advanced Manufacturing in Sweden and Europe. It will bring together education, at VET and HVET level, with stakeholder, such as industrial companies, to link education towards technological development and research to be able to educate the state-of-the-art technology all over Europe. The mobile education environment will achieve knowledge dissemination by traveling to schools, institutions and production sites that are lacking the knowledge or the resources to educate Advanced Manufacturing.

4.2. Digikoord

The purpose of the project Digikoord is to develop networks between stakeholders in Eastern Central Sweden. These networks intend to use existing competences and to initiate dissemination of knowledge in order to make it possible for small and mediums-sized industrial companies to take a step outside of their industrial comfort zone. The project generates opportunities for training, education, renewal and adjustment for increased competitiveness in small and medium-sized companies and industry-related enterprises in 3D/AM, in line with the new “Smart industry” industrialization strategy, focused on supplying knowledge within digitalization, industrial revolution 4.0, etc.

4.3. URRATS BAT

"Provider" that promotes new businesses that supply the factory of the future works with enabling technologies within the area of Advanced Manufacturing.



Figure 5 Artificial vision, virtual and augmented reality, collaborative robotics, additive manufacturing, cloud computing, big data, Bloch chain, cybersecurity Source: Tknika

Smart factories will be the engine of change in a connected and constantly evolving environment. Environments in which people and their knowledge will continue to be, even more strongly, the driving force of their activity. Because the future industry feeds on learning, an essential source of this knowledge will be the suppliers themselves. "Provider" works in two lines of work: Dissemination days and business ideas competition (Proposals focusing on different smart factory enabling technologies)



Figure 6: Augmented reality and virtual reality andCybersecurity Workshop Source: Tknika

Here are some of the entrepreneurship projects that have been presented in the last two calls for proposals:

- Cryptocurrency and infrastructure solutions for blockchain
- A night monitoring system for children with cardiac and respiratory:
 - Cardiac and respiratory pathologies
- Development of web applications and virtual and augmented reality apps
- Development of architectural plans and installations, 3D /VR/AR models.
- Development of exoskeletons incorporating state-of-the-art sensors and artificial intelligence
- Development of virtual reality educational tools
- Universal baby sleeping bags with sensors (temperature and ventilation)

Figure 7 : Urrats Bat startups community portal Source: Tknika

